THE INSECT FAUNA OF NEW JERSEY GREENHOUSES EXCLUSIVE OF THE COCCIDÆ.

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While greenhouse insects are not strictly a part of the New Jersey fauna, many of them are to all purposes firmly established in their glass homes and constitute a force to be reckoned with by the grower of indoor plants. The number of square feet under glass in New Jersey is conservatively estimated at several millions and in this somewhat tropical atmosphere, certain species breed more or less continually. The following list while dealing only with New Jersey insects is representative of conditions in most greenhouses in northeastern United States. Forty-nine species are listed exclusively of the Coccidæ which have been treated in a separate paper. This family numbers thirty-two species all of which belong strictly to the greenhouse fauna, being unable to maintain themselves out of doors in New Jersey throughout the year. The list while aiming to be as complete as possible does not include accidental visitors remaining only for short periods of time or such insects as white grubs and wireworms accidently introduced in the soil and troublesome until they have been worked out.

NEW JERSEY GREENHOUSE INSECTS.

Order THYSANURA.

Sub-order COLLEMBOLA.

Achoreutes armatum Nicolet.

Found in greenhouses where mushrooms are grown.

Isotoma quadri-oculata Tullb.

A greenhouse species imported from Europe.

Order THYSANOPTERA.

Family **THRIPIDÆ.**

Parthenothrips dracænæ Heeger.

On *Drachæna, Ficus,* sp., palms.

Thrips tabaci Lind.

The onion thrips. On cucumbers under glass.

Heliothrips hæmorrhoidalis Bouche.

The common greenhouse thrips. Feeds on ferns, croton, dahlias, azaleas and others.

Order HOMOPTERA.

Family **APHIDIDÆ.**

Aphis gossypii Glover.

The melon aphis. On cucumbers under glass.

Aphis hederæ Kalt.

On English ivy under glass. Not common.

Aphis nerii Fonsc.

On oleander. Not common.

Aphis rufomaculata Wils.

Green aphis of chrysanthemum. Also occurs outside.

Rhopalosiphum violæ Pergande.

On violets in greenhouses.

Macrosiphum lactucæ Kalt.

The lettuce plant louse. On lettuce under glass.

Macrosiphum rosæ Linn.

The rose aphis, common. Also occurs outside.

Macrosiphum sanborni Gill.

The black aphis of chrysanthemum. Also occurs outside.

Myzus rosarum Kalt.

On roses. Common. Also occurs outside.

Myzus persicæ Sulz.

Attacks carnations, asparagus fern, *Primula* under glass. Occurs outside on peach, etc.

Family **ALEYRODIDÆ.**

Aleyrodes vaporarium West.

The "greenhouse white fly," found on tomato, melon, cucumber, fuchsia, heliotrope and many others under glass.

Order HEMIPTERA.

Family **MIRIDÆ.**

Halticus citri Ashm.

An outside feeder, but has been found in greenhouses on chrysanthemum and smilax.

Order DERMAPTERA.

Family **FORFICULIDÆ.**

Forficula auricularia Linn.

The common European "ear-wig." Found occasionally on imported plants in greenhouses.

Order ORTHOPTERA.

Family **BLATTIDÆ.**

Periplaneta americana Linn.

Occasionally found in greenhouses.

Periplaneta australasiæ Fabr.

In greenhouses. Common.

Pycnoscelus surinamensis Linn.

In greenhouses.

Order COLEOPTERA.

Family **COCCINELLIDÆ.**

Adalia bipuncta Linn.

Occasionally found in greenhouses.

Exochomus 4-pustulata Linn.

Has been taken in greenhouses on bay tree. An importation from Europe.

Family **OTIORHYNCIHIDÆ.**

Aramigus fulleri Horn.

"Fuller's rose beetle." Feeds on roses and gardenia. Larvae feed on roots of these plants. Not common.

Family **CALANDRIDÆ.**

Eucactophagus graphipterus Champ.

Larvæ live in bulbs of *Lycaste, Odontoglossum* and other species of orchids having large soft bulbs. Not absolutely common. Introduced from Central America.

Order LEPIDOPTERA.

Family **ARCTIIDÆ.**

Hyphantria cunea Dru.

Larvæ occasionally occur in greenhouses on various plants during the fall.

Diacrisia virginica Fab.

Larvæ occasionally found during fall in greenhouses feeding on various plants.

Isia isabella S. & A.

Larvæ found under same conditions as above two species.

Family **NOCTUIDÆ.**

Peridroma margaritosa Haw.

Larva is known as the variegated cut worm. Attacks carnation buds, sweet peas, chrysanthemum, smilax and other plants. Occurs outside on various plants and is one of the injurious cut-worms.

Callopistria floridensis Guen.

Larva is known as the "Florida fern caterpillar." Feeds on various ferns under glass. Quite a serious pest.

Family **PYRALIDÆ.**

Hymenia perspectalis Hubn.

Larva known as the Alternanthera worm. Feeds on alternanthera varieties. Probably occurs outside.

Phlyctaenia ferrugalis Hubn.

The common greenhouse leaf-tier. Larva injures chrysanthemum, ageratum, geranium, carnation, violet, rose and others. Common out of doors.

Nymphula obliteralis Wlk.

In greenhouses, larva living in case on leaf of water lily and other aquatic plants.

Family **TORTRICIDÆ.**

Archips rosaceana Harr.

The rose leaf roller. Larva feeds on flower buds of rose, also on carnations. Common on orchard trees and small fruits outside.

Family **YPONOMEUTIDÆ.**

Plutella maculipennis Curt.

The diamond back moth. Larva feeds on sweet alyssum and garden stocks. Common outside on cabbage, etc.

Family **TINEIDÆ.**

Gracilaria zachrysa Meyrick.

Larvæ feed on azalea leaves. Introduced from Europe. Up to present has not been found on hardy azaleas.

Order HYMENOPTERA.

Family **ENCYRTIDÆ.**

Encyrtus flavus Howard.

Bred from *Coccus hesperidum* (soft scale).

Family **CHALCIDIDÆ.**

Isosoma orchidearum West.

"The Cattleya fly." Infests *Cattleya* orchids, larvæ living in the bulbs. Quite a pest.

Family **FORMICIDÆ.**

Pheidole anastasii Emery.

Common in greenhouses.

Tetramorium caespitum Linn.

The lawn-ant. An importation from Europe. Has been found in greenhouses.

Tetramorium guineense Fabr.

Common in greenhouses.

Prenolepis fulva Mayr. subsp. **pubens** Forel.

Common in greenhouses.

Order DIPTERA.

Family **MYCETOPHILIDÆ.**

Sciara multiseta Felt.

Occurs in greenhouses where mushrooms are raised.

Sciara inconstans Fitch.

The fickle midge. Occurs in greenhouses where mushrooms are grown.

Family **CECIDOMYIIDÆ.**

Neocerata rhodophaga Coq.

The rose midge. Maggots occur in leaf and flower buds of roses in greenhouses.

Phytophaga violicola Coq.

The violet gall midge. Maggots curl leaves of greenhouse violets. Not common.

Family **PHORIDÆ.**

Aphiochæta albidihalteris Felt.

Occurs in greenhouses where mushrooms are grown. One of the mushroom flies.

Family **SYRPHIDÆ.**

Eristalis tenax Linn.

The common drone or chrysanthemum fly. Occasionally found in greenhouses during fall.

Family **AGROMYZIDÆ.**

Phytomyza chrysanthemi Kowarz.

The chrysanthemum leaf-miner or Marguerite fly. Larvæ mine leaves and do considerable damage. Has not been found breeding freely outside.

Summarizing the above list, the orders are represented as follows:

	Strictly Greenhouse Species.	Species Which Occur In and Out Doors.	Total.
Thysanura	1	1	2
Thysanoptera	2	1	3
Homoptera	4	7	11
Hemiptera	0	1	1
Dermoptera	1	0	1
Orthoptera	2	1	3
Coleoptera	2	2	4
Lepidoptera	3	8	11
Hymenoptera	5	1	6
Diptera	3	4	7
Totals	23	26	49

Including the 32 species of Coccidæ, the Homoptera is by far the best represented order, most of the members belonging to the families Aphididæ and Coccidæ. This is no doubt due to the close relationship which exists between the members of these families and their host plants and also the comparative ease and safety with which they can be transported. The Lepidoptera is the next best represented group followed by the Diptera and Hymenoptera, the remaining orders being poorly represented. The Diptera and Hymenoptera can undoubtedly be added to by breeding out the parasites of the species listed. It was thought unwise however to list the known parasites before they had actually been found in New Jersey under glass. The Coleoptera can also be increased by the identification of two species recently found feeding on orchids.

Of the total of 49 species listed, 23 are unable to maintain themselves out of doors, the remaining 26 being equally at home either under glass or in the open. Most of the strictly greenhouse species

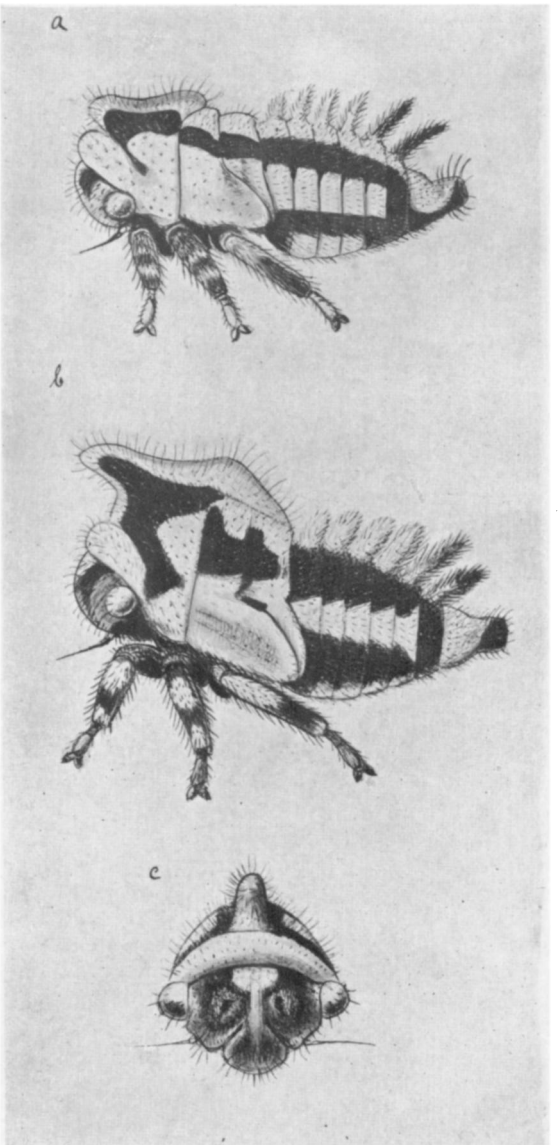
are of tropical or sub-tropical origin, having been introduced at various times from such localities and afterwards flourishing in an atmosphere approaching that of their natural homes and containing their native food plants. This is especially true of such species as *Pheidole anastasii* Emery, *Tetramorium guineense* Fabr., *Prenolepis fulva* Mayr. subsp. *pubens* Forel and *Isosoma orchidearum* Wst. in the Hymenoptera, of *Phytophaga violicola* Coq., in the Diptera, of *Callopistria floridensis* Guen., in the Lepidoptera, of *Eucactophagus graphipterus* Champ., in the Coleoptera and of the greenhouse roaches in the Orthoptera.

The 26 species which occur both in and out of greenhouses, are practically all inhabitants of the upper austral zone which have at different times made their way into the greenhouses where different conditions of temperature and moisture prevail and have become acclimated for short and long periods of time. In other words, each species has simply followed its one or more food plants into the new climate.

The inability of the strictly greenhouse or tropical species to maintain themselves out of doors is undoubtedly due more to the absence of proper food than anything else, this lack of food being as effective a check upon the spread of insects as climate, the food of course also depending upon climate and soil.

Thus, the insect fauna of a greenhouse really depends upon the kinds of plants growing there. If the flora is tropical, most of the insects will be also. If the plants are local growing as well outside of as in the greenhouse, then the insects feeding upon them will be local species. Out of a total of 81 species (including the Coccidæ) found in New Jersey under glass, two-thirds are strictly greenhouse insects because most greenhouses are devoted to the growing of exotic plants.

It is a noteworthy fact that the majority of greenhouse insects have not received the attention that they should from economic entomologists and as a result most of the work done in combating these pests is ineffective and worthless. Thus there is open to the economic man, an almost virgin field, in which the factors of temperature and moisture will play an important and vital part in successful control.



Membracidæ.